PB-229 792

REPORT ON EFFECTS OF WASTE DISCHARGES ON WATER QUALITY OF THE SNAKE RIVER AND ROCK CREEK TWINS FALLS AREA, IDAHO

National Field Investigations Center-Denver
Denver, Colorado

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ENVIRONMENTAL PROTECTION AGENCY

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AND

REGION X, SEATTLE, WASHINGTON

CLEAN WATER

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WATER QUALITY OFFICE

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PREPARED BY

NATIONAL FIELD INVESTIGATIONS CENTER-DENVER
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REGION X, SEATTLE, WASHINGTON

FEBRUARY 1973

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GLOSSARY OF TERMS

BOD - Biochemical Oxygen Demand, 5-Day

COD - Chemical Oxygen Demand

DO - Dissolved Oxygen

TOC - Total Organic Carbon

cfs - flow rate given in cubic feet per second

gpm - flow rate given in gallons per minute

mgd - flow rate given in million gallons per day

mg/l - concentration given in milligrams per liter

LWK - live weight killed

RM - river mileage

µg/l - concentration in micrograms per liter

µmhos/cm - unit of specific conductance (mho -- the inverse of the standard unit of electrical resistance, the ohm) measured over a 1-centimeter distance, conventionally made at 25°C.

I. INTRODUCTION

The Environmental Protection Agency (EPA), Region X, requested the National Field Investigations Center-Denver (NFIC-D), EPA, Office of Enforcement, to conduct comprehensive water quality investigations in the Snake River Basin (Twin Falls area). These studies were conducted from November 2 to 17, 1971 and included an evaluation of municipal and industrial wastewater treatment facilities. Subsequently, stream surveys were conducted on the Snake River, from upstream of Perrine Coulee (RM 611.5) to downstream from Rock Creek (RM 606.2), and on Rock Creek from RM 606.8/14.7 to the mouth. The primary objectives of these investigations were to:

1. Determine the characteristics and magnitude of municipal and industrial waste loads discharged to the Snake River and its tributaries in the Twin Falls Area.

2. Evaluate the impact of these waste discharges on the quality of the receiving waters.

3. Ascertain if municipal and industrial discharges are in compliance with applicable water quality standards and regulations.

4. Provide a basis for evaluation of Refuse Act Permit applications.

5. Determine if abatement actions are necessary.

Water Quality Standards applicable to the Snake River, an interstate stream, were established in June 1967 by the Idaho State Board of Health [Appendix A]. Subsequently, in September 1968, the Idaho State Board of Health established the Water Quality Standards for all state waters [Appendix B]. These Standards consist of three components: 1) Stream classifications

(interstate waters) that designate water uses to be protected; 2) Water quality criteria that specify water quality conditions which must be maintained; and 3) An implementation plan that establishes time schedules for providing adequate wastewater control facilities for all major sources of pollution.

Bacterial analyses reported herein were provided by the Environmental Protection Agency (EPA), Region X, Seattle, Washington.

The cooperation of personnel of City, State, and Federal agencies and industries in supplying information and assistance is gratefully acknowledged.

The Federal Water Pollution Control Act Amendments of 1972 were enacted subsequent to the completion of the survey and preparation of the draft report. The document has been extensively revised to reflect the requirements of the 1972 Amendments.

Additional studies by EPA, Region X and the Idaho State Board of Health are under way at this time. Those studies may indicate that treatment requirements more stringent than those suggested herein, may be necessary in order to protect the receiving waters for their designated uses.

II. SUMMARY AND CONCLUSIONS

1. The Twin Falls Municipal Wastewater Treatment Plant presently provides only primary treatment. Average BOD removal during the period of the survey was approximately 31 percent. Disinfection of the effluent during this study was inadequate. Failure by the City to provide "the highest and best practicable treatment and control," constitutes a violation of the policies of the State Board of Health, as set forth in the Idaho Water Quality Standards for interstate waters. The Idaho State Board of Health has directed that the city provide secondary treatment by July 1, 1973. City officials should be formally advised that Federally promulgated regulations pertaining to secondary treatment and disinfection of domestic wastes must be met, and that city ordinances, which will ensure compliance with Federal pretreatment regulations, must be enacted and enforced.

2. Information was obtained [Appendix E] indicating the intent of Independent Meat Company and Idaho Frozen Foods, Inc., to connect process waste discharges to the municipal collection and treatment system. Plans for pretreatment of the process wastes have not been concluded. Company officials should be formally advised that pretreatment must be provided to comply with Federal regulations and applicable City ordinance requirements.

3. Rock Creek is severely degraded by industrial wastewater discharges between RM 12.4 and the mouth. The BOD level and total- and fecal-coliform bacterial densities increased 15, 116,000 and 80 times, respectively, in this reach. Dissolved-oxygen concentrations were depressed at RM 6.6,

RM 8.5, RM 9.4, and RM 11.8 to levels below those required by the Idaho Water Quality Standards. Industrial waste solids blanketed portions of the stream bottom damaging aquatic life in these stream sections, including fish propagation.

4. Colonial Concrete, Inc., violated the Idaho Water Quality Standards by the discharge of inorganic solids which both blanketed the bottom and discolored the waters of Rock Creek. Company officials should be advised that permit conditions will limit the suspended solids concentration to 20 mg/l in the discharge.

5. The Amalgamated Sugar Company violated the Idaho Water Quality Standards by the daily discharge into Rock Creek of 16,700 pounds of BOD, 9,580 pounds of suspended solids, and excessive numbers of coliform bacteria. During the survey a dike forming the flume water lagoon ruptured, allowing an estimated 60 acre-feet of essentially untreated flume water to enter Rock Creek. Company officials should be advised that permit conditions will limit permissible discharge levels to those specified for the sugar beet industry [Appendix D]. To meet these conditions containment may be necessary during low flow periods. The company should further be advised that all lagoon dikes must be constructed according to accepted engineering practices. Any further discharge or spill will become the basis for prosecution under applicable laws and regulations.

6. Idaho Frozen Foods, Inc., contributed to Idaho Water Quality Standards violations by the daily discharge into Rock Creek of 16,800 pounds of BOD, 26,300 pounds of COD, 3,900 pounds of suspended solids, 175 pounds of oil and grease, and excessive numbers of coliform bacteria. Company

officials should be formally advised that treatment must be provided to meet the permit conditions [listed in Appendix D] if discharge to Rock Creek is continued. If the effluent is discharged to the municipal collection and treatment system, pretreatment must be provided that meets applicable Federal regulations and City ordinances.

7. Independent Meat Company contributed to violations of Idaho Water Quality Standards by the daily discharge into Rock Creek of 147 pounds of BOD and excessive numbers of coliform bacteria. The intent, at the time of this investigation, was to connect the discharge to the municipal collection and treatment system.

8. The inflow of Rock Creek increased the total-coliform bacterial density in the Snake River by 20 times. The bacterial contamination from Rock Creek alone would cause a violation of the bacterial criteria established for the Snake River, an interstate stream.

9. The BOD and suspended solids concentrations in Rock Creek can be reduced to levels compatible with Water Quality Standards by: 1) elimination of wastewater discharges to Rock Creek from Idaho Frozen Foods and Independent Meat Company and 2) reduction of the loads discharged by Colonial Concrete, Inc., and Amalgamated Sugar Company through the installation of treatment that meets the requirements of the proposed permit conditions [Appendix D].

10. Operators of fish hatcheries, in the Twin Falls area, should be advised that permit conditions will require removal of solids from the wastewater discharge during cleaning operations.

III. DESCRIPTION OF AREA

The Snake River in the Twin Falls area (RM 611.5 to RM 606.2) flows westwardly through a deep canyon [Figure 1]. Access to the valley floor is limited. The width of the canyon varies, and the land between the vertical walls and the water's edge is, for the most part, flat. It is wide enough, however, to afford acreage for ranches, resorts, trout farms, and orchards. Recreational areas located along the Snake River attract sportsmen, sightseers, and boating enthusiasts.

Perrine Coulee is a stream that, in emptying into the Snake River (RM 611.3) downstream of the Perrine Coulee Bridge, cascades off the 500-foot high canyon wall.

Rock Creek flows in a narrow canyon through the outskirts of Twin Falls to its confluence with the Snake River (RM 606.3). The City of Twin Falls has a population of about 22,000 persons and is the home of The College of Southern Idaho. Agriculture and food-processing (chiefly potatoes and sugar beets) are the primary economic activities.

The climate in the Twin Falls area is typically characterized by warm-to-hot, dry summers and cold winters. Extreme temperatures range from minus 30° to 100°F. The average annual precipitation is approximately eight inches.

The Snake River, an interstate stream, has been classified by the Idaho State Board of Health as suitable for domestic and industrial water supply, irrigation, livestock watering, salmonid fish rearing, aquatic and wildlife, and aesthetics [Appendix A]. Rock Creek, an intrastate stream, is used for industrial water supply and recreation.

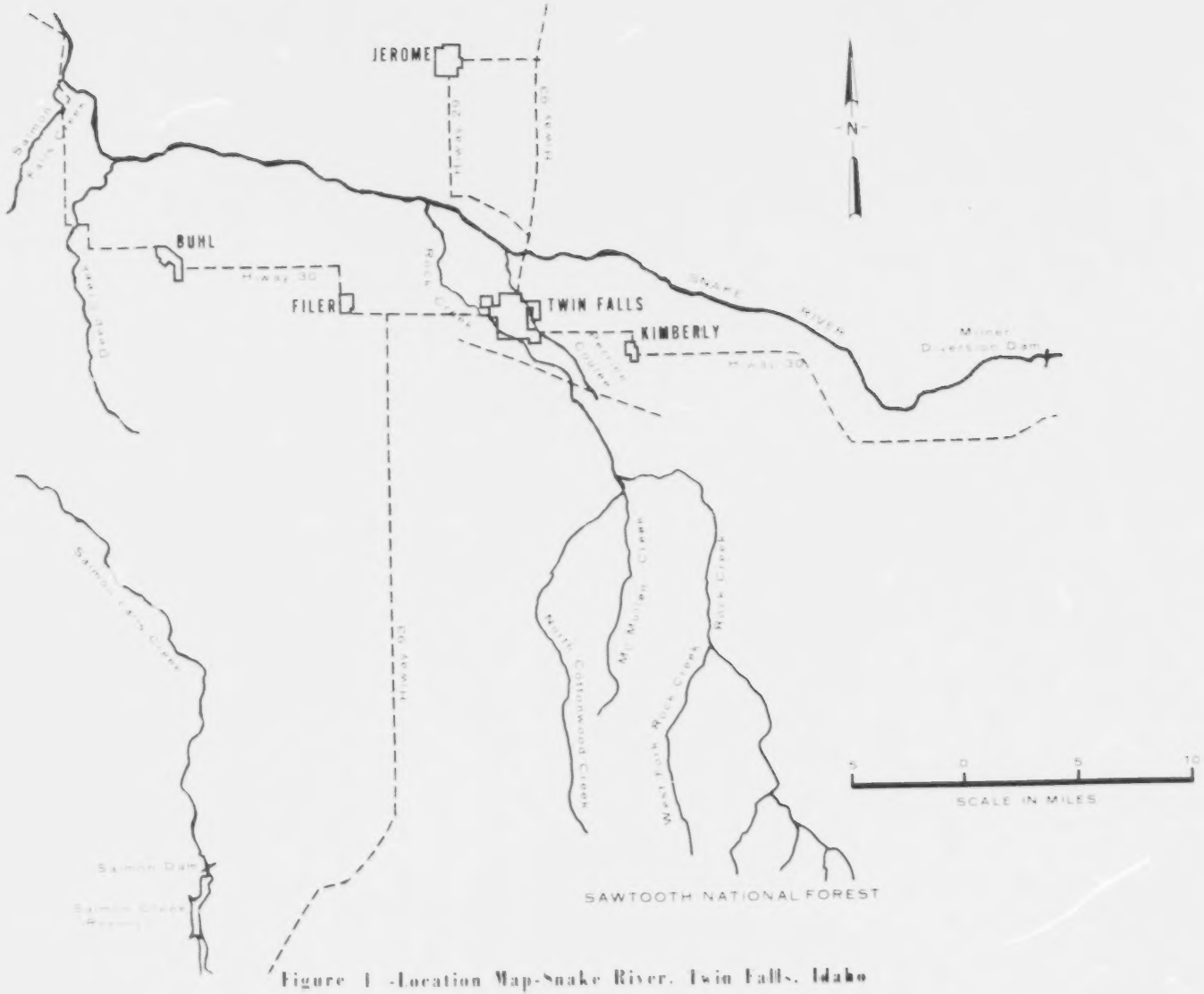

Figure 1 -Location Map-Snake River, Twin Falls, Idaho

IV. WASTE SOURCES

Municipal and industrial waste sources [Table 1] in the Snake River Basin (RM 606.2 to 611.5) were investigated during November 1971 [Figure 2, inside back cover]. Most industries in the Twin Falls area are connected to the Twin Falls Wastewater Treatment Plant. In addition to several trout farms, the following five industries discharge wastewater directly to Rock Creek:

(1) Amalgamated Sugar Company

(2) Colonial Concrete, Incorporated

(3) Idaho Frozen Foods, Incorporated

(4) Independent Meat Company

(5) Ready to Pour Concrete

During the study period data were obtained on water pollution control practices at each plant which discharges wastewater to Rock Creek and the Snake River. Information was secured through in-plant surveys, inspection of Refuse Act Permit applications, and contact with plant representatives. [Individual reports on each waste source evaluation are on file at the National Field Investigations Center-Denver. Study methods for waste source evaluation and stream surveys are found in Appendix C.]

A. MUNICIPAL

The Twin Falls Wastewater Treatment Plant, serving a population of about 22,000, was the only municipal waste source evaluated. This plant provides primary treatment followed by disinfection. An estimated 12 percent of the flow was industrial wastewater.

TABLE 1

MUNICIPAL AND INDUSTRIAL WASTE SOURCES
SNAKE RIVER
TWIN FALLS, IDAHO
NOVEMBER, 1971

Map Key[a/]	Name	Receiving Water	Treatment Facilities	Abatement Needs	Remarks
A	Twin Falls Wastewater Treatment Plant (RM 610.2)	Snake River	Primary clarifiers with disinfection	Construction of secondary treatment and adequate disinfection	Disinfection was inadequate. A new secondary treatment plant is scheduled to be in operation by July 1, 1973.
B	Ready to Pour Concrete (RM 606.8/6.1)	Rock Creek	Primary and Secondary sedimentation basins	Construction of the best practicable treatment method	
C	Colonial Concrete, Inc. (RM 606.8/6.5)	Rock Creek	None	Construction of the best practicable treatment method	According to Company officials sedimentation basins will be in operation by July 1, 1972.
D	Idaho Frozen Foods, Inc. (RM 606.8/8.2)	Rock Creek	Flume water-primary clarifier Process water-grease trap, rotating screens, primary clarifier	By July 1, 1973 connect to the municipal sewer or provide the best practicable treatment available	This waste discharge will be connected to the Twin Falls sewer by July 1, 1973 [Appendix E].
E	Frame Trout Farm (RM 606.8/8.4)	Rock Creek	None	Sediment basins to remove solids during periods when raceways are cleaned	It was observed that the effluent contain a large amount of solids when raceways were cleaned.
F	Independent Meat Co. (RM 606.8/11.2)	Rock Creek	Condenser water-none Process water-anaerobic lagoon	By July 1, 1973 provide aeration of the lagoon effluent and connect to municipal sewer or provide the best practicable treatment available	This discharge will be connected to the Twin Falls sewer by July 1, 1973 [Appendix E].
G	Amalgamated Sugar Company (RM 606.8/12.4)	Rock Creek	Flume water-closed cycle Lime wastes non-over-flowing lagoons, ashes from boiler & lime kiln non-over-flowing lagoon General plant waste, Condenser water and CSF Sewer-none	Improved operation None None Secondary Treatment by July 1, 1973	The industry should employ the best practicable treatment technology available to the sugar beet industry [Appendix D], construction should be in accord with standard engineering practices (i.e. proper compaction of dikes, etc.)

a/ See Figure 2.

The in-plant survey revealed that BOD removal ranged from 21 to 38 percent [Table 2]. BOD in the effluent averaged 220 mg/l. High bacterial densities demonstrated that disinfection of the effluent was not adequate [Table 3].

Failure by the City to provide "the highest and best practicable treatment and control" constitutes a violation of the policies of the State Board of Health, as set forth in the Idaho Water Quality Standards for interstate waters.

The Idaho State Board of Health has required the City of Twin Falls to have secondary treatment facilities in operation by July 1, 1973. An engineering study has been completed and City officials indicate that this deadline will be met.

The Federal Water Pollution Control Act Amendments of 1972 requires that publicly owned wastewater treatment plants provide best practicable treatment by 1977. Regulations, now being promulgated by EPA, will limit BOD and suspended solids in the treated effluent and require disinfection.* Further, it is proposed that industrial wastewaters that are discharged to publicly owned treatment systems be pretreated to levels comparable to domestic sewage and to remove substances which can inhibit treatment processes or pass through such systems in concentrations that are detrimental to the quality of the receiving waters. Twin Falls must, therefore, enact and enforce ordinances that will implement the requirements of these regulations.

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* The BOD and suspended solids will each be limited to a monthly average of 30 mg/l and a weekly average of 45 mg/l or 85 percent overall reduction, whichever produces the best quality effluent. The fecal-coliform bacterial density will be limited to a weekly average of 400/100 ml and a monthly average of 200/100 ml.

TABLE 2

SUMMARY OF ANALYTICAL DATA FOR MUNICIPAL AND INDUSTRIAL WASTE SOURCE EVALUATIONS
SNAKE RIVER BASIN - TWIN FALLS AREA
NOVEMBER 1971

Description	Flow mgd Average	pH Range	Conductivity µmhos/cm Range	Temp °C Range	BOD mg/l Range	BOD mg/l Average	COD mg/l Range	COD mg/l Average	Settleable Solids ml/l Range	Settleable Solids ml/l Average	Suspended Solids mg/l Average	Oil & Grease mg/l
Twin Falls Wastewater Treatment Plant												
Influent	4.35	7.6-8.1	1350-2400	17-19	280-390	320	310-799	465	6-15	10		
Effluent	4.35	7.2-7.7	1500-2000	16-18	210-240	220	231-293	255	0.1-0.2	0.2		24[a]
Amalgamated Sugar Company												
CSF Sewer	1.0	8.2-8.6	620-875	37-40	60-320	220			0.5-1.7	0.9	55	
Main Sewer[b]	9.5	8.2-8.8	490-600	28-33	150-270	210			1.0-1.8	1.3	155	
Colonial Concrete, Inc.	0.29[c]									17[a]	40,000[a]	
Frame Trout Farm	3.2[d]	7.6-7.9	800-900	11-12	1-4	3						
Idaho Frozen Foods, Inc. Combined effluent	1.5	6.2-10.5	1800-2400	21-24	1300-1400	1370	1870-2360	2100	1.1-4.5	2.3	320	14[a]
Independent Meat Company Anaerobic lagoon effluent	0.1	6.7-7.6	2150-2850	21-23	160-190	175	158-574	355	0.7-2.0	1.2		8[a]
Ready to Pour Concrete	0.22	8.0-8.3	1100-1180	5-6						<0.1[a]		

a/ There is only one sample.
b/ The main sewer contains general plant wastes and condenser water.
c/ This is an estimated value.
d/ Flow was obtained from the permit application.

TABLE 3

SUMMARY OF BACTERIOLOGICAL ANALYSES OF MUNICIPAL AND INDUSTRIAL WASTE DISCHARGES
SNAKE RIVER BASIN - TWIN FALLS AREA
NOVEMBER 1971

Map Key[a/]	Station Description	Dates	Total Coliform/100 ml			Fecal Coliform/100 ml			Fecal Streptococcus/100 ml		
			Maximum	Arith. Mean	Minimum	Maximum	Arith. Mean	Minimum	Maximum	Arith. Mean	Minimum
A	Twin Falls Wastewater Treatment Plant effluent after chlorination	11/9-15/71	>800,000	>252,000	140	>60,000	>17,300	<10	62,000	16,800	60
D	Idaho Frozen Foods, Inc. combined effluent	11/9-15/71	$1,600 \times 10^6$	360×10^6	1.7×10^6	1,600,000	<500,000	17,000	71×10^6	12.4×10^6	52,000
E	Frame Trout Farm effluent	11/12-16/71	7,200	6,100	4,800	10	<10	<10	100	60	20
F	Independent Meat Co.										
	Condenser water discharge	11/9-11/71	110,000	39,000	2,000	500	250	60	2,000	1,480	650
	Anaerobic lagoon effluent	11/9-15/71	700,000	251,000	100,000	62,000	49,000	40,000	40,000	119,400	4,500
G	Amalgamated Sugar Company combined effluent	11/9-15/70	1,100,000	675,000	300,000	350,000	<155,000	<100,000	1,000,000	276,000	76,000

a/ See Figure 2.

Design data pertaining to the required improvements to the Twin Falls Wastewater Treatment Plant were not available. Thus, no evaluation of the capability to meet the new Federal requirements could be made.

B. INDUSTRIAL

Permit conditions for most classes of industrial waste guidelines are to be promulgated by EPA. Effluent guidelines [Appendix D] for the permit conditions have been provided to the EPA Regional Permit Program Offices. The final guidelines are expected to be essentially those set forth in the proposed guidelines. The industrial waste sources examined during the investigation have been evaluated in terms of the expected permit conditions. Those evaluations are summarized in the following paragraphs.

Amalgamated Sugar Company, Box 127, Twin Falls, Idaho.

This sugar mill is a Steffen house operation and processes about 4,800 tons of beets per day. Flume water, lime wastes, and ash-laden wastewaters are treated in a "closed" water recycle system. All other wastes are combined and discharged to Rock Creek without treatment.

An in-plant survey was conducted November 8 to 17, 1971, to evaluate wastewater being discharged from this plant. During the survey a dike, forming the flume-water emergency storage pond, ruptured due to improper construction, allowing an estimated 60 acre-feet of flume water to spill into Rock Creek.*

* A separate report entitled "Report on the In-Plant Evaluation and Investigation of an Accidental Spill at the Amalgamated Sugar Company, Twin Falls, Idaho" documenting this spill was prepared by the NFIC-D and forwarded to Region X, Seattle, Washington, February 4, 1972.

Results of the in-plant survey showed that the average daily loads discharged to Rock Creek were 16,700 pounds of BOD (3.5 lb/ton of beets) and 9,580 pounds of suspended solids (2.0 lb/ton of beets), respectively [Table 2]. This discharge depressed the dissolved oxygen in Rock Creek causing a violation of Idaho Water Quality Standards. These loads do not include the 60 acre-feet of flume water discharged during the spill. The total-and fecal-coliform bacteria densities in the effluent averaged 675,000/100 ml and less than 155,000/100 ml, respectively [Table 3]. This discharge resulted in average total- and fecal-coliform bacteria densities in Rock Creek [RM 11.8] of 223,600/100 ml and 11,900/100 ml, respectively. These densities violate the Idaho Water Quality Standards applicable to all waters of the State.

In order to protect the quality of the receiving waters, meet applicable State and Federal water quality standards, and comply with the 1972 Amendments, Amalgamated Sugar Company must implement treatment practices that will attain or surpass the effluent guidelines for the sugar-beet industry [Appendix D].

Colonial Concrete, Incorporated, Box 1151, Twin Falls, Idaho

Sand is washed at the rate of 25 tons/hour at this plant. Wash water is obtained from a seep (spring) at the rate of 200 gpm and subsequently, discharged to Rock Creek without treatment. A sample of the highly turbid effluent contained 17 ml/l of settleable solids and 40,000 mg/l of suspended solids [Table 2].

Rock Creek immediately downstream from this discharge was visibly discolored. This discharge caused a sediment blanket which covered the

bottom of Rock Creek, interfering with the beneficial use of the creek as a fishery and violating the Idaho Water Quality Standards for all state waters.

According to a Colonial Concrete official, primary and secondary settling ponds were to be constructed and in operation by July 1, 1972. Application has not been made for a Refuse Act Permit to discharge wastewaters to Rock Creek, a tributary to a navigable river.

Company officials should be advised that application for a discharge permit must be made and that the new treatment facilities must reduce suspended solids in the discharge to not more than 20 mg/1 [Appendix D].

Idaho Frozen Foods, Incorporated, 856 Fall Street, Twin Falls, Idaho

This Company processes 500 tons of potatoes per day from September to June to produce frozen packaged potatoes (french fries, shoestring potatoes, and hashbrowns). Potatoes are trucked to the plant and flumed to the process line. Flume water is treated in a clarifier (35 ft diameter, 14 ft deep) with the majority of the water being recycled. Solids removed from the clarifier are spread on nearby fields. Excess clarified water is discharged to Rock Creek.

Process wastewater passes through a grease trap into two rotating screens and then to a clarifier (55 ft diameter, 12 ft deep). Solids removed by the rotating screens and clarifier are used for cattle feed. Effluent from the clarifier combines with the excess flume water and is discharged to Rock Creek.

A survey was conducted November 8 to 16, 1971, to ascertain waste loads discharged from this plant. Analytical results [Table 2] indicated that

Idaho Frozen Foods, Incorporated, discharged average daily loads of 16,800 pounds of BOD (34 lb/ton of potatoes), 26,300 pounds of COD (53 lb/ton of potatoes), and 3,900 pounds of suspended solids (8 lb/ton of potatoes). This discharge depressed the dissolved oxygen in Rock Creek resulting in a violation of Idaho Water Quality Standards. A sample of the effluent contained 14 mg/l (175 lb/day) of oil and grease. Total- and fecal- coliform bacteria densities in the combined effluent ranged from 1,700,000 to 1,600,000,000/100 ml and 17,000 to 1,600,000/100 ml, respectively [Table 3]. These coliform organisms contributed to severe bacterial contamination of Rock Creek.

The Idaho State Board of Health has required Idaho Frozen Foods, Incorporated, to provide adequate treatment by July 1, 1973. Company officials proposed to either connect the wastewater discharge to the municipal sewer or provide adequate treatment before this date [Appendix E].

Company officials should be advised that treatment, to conform with the permit conditions listed in Appendix D, must be provided if the discharge is continued to Rock Creek. If the effluent is discharged to the municipal collection and treatment system, pretreatment must be provided to meet applicable Federal regulations and City ordinances.

Independent Meat Company, Box EE, Twin Falls, Idaho

This Company slaughters cattle and hogs, processes meat, cures and smokes meat products, manufactures sausage products, and renders edible fat. The rated daily capacity of the plant is 150 hogs and 50 cattle.

All wastewater except condenser water is discharged to an anaerobic

lagoon. The lagoon effluent is discharged to Rock Creek. Condenser water is discharged directly to Rock Creek.

An in-plant survey was conducted November 8 to 11, 1971, to ascertain waste loads discharged from this plant. Results of the analysis [Table 2] indicate that Independent Meat Company discharged average daily loads of 147 pounds of BOD (approximately 1.7 lb/1,000 lb LWK) and 7 pounds of oil and grease (approximately 0.08 lb/1,000 lb LWK). The total- and fecal-coliform bacteria densities ranged from 100,000 to 700,000/100 ml and 40,000 to 62,000/100 ml, respectively [Table 3]. These coliform organisms contributed to severe bacterial contamination in Rock Creek.

Wastewater discharged from Independent Meat Company contributed to the depression of DO concentrations in Rock Creek. The dissolved oxygen ranged from 69-94 percent of saturation upstream (RM 11.8) of the discharge to 60-68 percent of saturation downstream (RM 9.4), a violation of the Idaho Water Quality Standards.

The Idaho State Board of Health has required Independent Meat Company to provide adequate treatment by July 1, 1973. The Company intends to connect to the municipal sewer before this date [Appendix E].

Company officials should be advised that pretreatment must be provided to meet the Federal regulations and applicable City ordinances. If the Company continues to discharge to Rock Creek, treatment must be provided to meet the permit conditions [listed in Appendix D].

Ready to Pour Concrete, Box 274, Twin Falls, Idaho

The Company operates eight months annually, washing sand and gravel at a maximum rate of 600 cubic yards/day. Wash water is obtained from a

drainage ditch (0.13 mgd) and discharged after use to Rock Creek following primary and secondary sedimentation. An eight-hour composite sample collected on November 8, 1971, showed the effluent discharged to Rock Creek contained less than 0.1 ml/l of settleable solids [Table 2].

Visual observations of the sedimentation basins showed short circuiting of wastewater through the secondary basin. This condition can be corrected by the relocation of the discharge from the primary basin into the secondary basin along with the addition of a dike in the primary basin.

Trout Farms and Hatcheries

Blue Lakes Trout Farm, Inc.; Canyon Trout Farm; Frame Trout Farm; and Twin Falls Fish Hatchery raise trout for commercial and stocking purposes. Water is obtained from major springs and discharged without treatment to Rock Creek and the Snake River.

An in-plant survey was conducted at Frame Trout Farm during November 12 to 16, 1971, to ascertain waste loads discharged into Rock Creek. Results of the analyses indicate that the effluent contained 1 to 4 mg/l of BOD [Table 2]. Visual observations showed that when raceways are cleaned large concentrations of solids (fish droppings, excess food, etc.) are discharged into the receiving waters.

Operation of Blue Lakes Trout Farm, Inc.; Canyon Trout Farm and Twin Falls Fish Hatchery is similar to that of Frame Trout Farm. It is believed, therefore, that the effluents from the other three trout farms would be of a similiar quality to that discharged from Frame Trout Farm.

Permits to be issued to the trout farms should specify that provision be made for removal of solids for the effluent during cleaning operations.

V. STREAM SURVEYS

During the period November 12 to 16, 1971, a water-quality survey was conducted on the Snake River (RM 606.2 to RM 611.5) and on Rock Creek from upstream of Twin Falls (RM 14.7) downstream to the mouth [Figure 2]. [Results of chemical and bacteriological analyses are provided in Tables 4, 5, and 6.]

A. ROCK CREEK

Rock Creek originates in the Sawtooth National Forest and flows northwest through Twin Falls to its confluence with the Snake River at RM 606.8. Upstream of Twin Falls at RM 14.7, Rock Creek was relatively unpolluted. Dissolved-oxygen concentrations ranged from 8.4 to 11.6 mg/l (84-112 percent of saturation) and total- and fecal-coliform bacterial densities averaged 190 and less than 35/100 ml, respectively. Water temperature ranged from 5° to 9° C, and BOD from 1 to 3 mg/l. From RM 14.7 to the mouth, Rock Creek flows through a deep narrow canyon where there is a drop in elevation of approximately 900 ft.

The Amalgamated Sugar Company [RM 12.4] discharged an average of 16,700 pounds of BOD per day. Average total- and fecal-coliform bacterial densities in the effluent were 675,000 and less than 155,000/100 ml, respectively. At Eastland Road (RM 11.8) the DO in Rock Creek decreased to a range of 6.8 to 8.8 mg/l (69 to 94 percent of saturation). Temperature ranged from 9° to 12.5°C, a temperature increase of approximately 3°C. BOD ranged from 40 to 70 mg/l. Average total- and fecal-coliform densities increased to 223,600 and 11,900/100 ml, respectively. This decrease in DO and the increase in temperature and bacterial densities violated the Idaho Water Quality Standards [Sections 6A, 6B, and 6D - Appendix B].

TABLE 4

SUMMARY OF FIELD MEASUREMENTS AND ANALYTICAL RESULTS
SNAKE RIVER, ROCK CREEK, AND PERRINE COULEE
November 12-16, 1971

Map Key[a/]	Station Description	Flow CFS Average	pH Range	Conductivity µmhos/cm Range	Temp °C Range	D.O. mg/l Range	D.O. % Sat Range	Total Alkalinity mg/l as $CaCO_3$ Average	BOD mg/l Range	BOD mg/l Average	TOC mg/l Range	TOC mg/l Average
1	Snake River downstream from Rock Creek (RM 606.2)	8,550 (est)	8.0-8.4	340-525	3.0-7.0	10.1-12.2	93-106	149	2-8	4	3-6	4
2	Snake River upstream of Rock Creek and downstream from Twin Falls wastewater treatment plant (RM 610.0)	8,350 (est)	8.0-8.3	400-480	3.5-6.0	10.4-12.0	94-103	141	1-3	2	3-6	4
3	Snake River upstream of Perrine Coulee (RM 611.5)	8,300 (est)	8.0-8.3	320-460	4.0-7.0	10.4-11.3	91-99	141	2-3	2	3-4	4
4	Perrine Coulee near mouth (RM 611.3/0.2)	13.8	8.3-8.7	400-540	2.0-6.0	10.4-12.0	91-103	154	2-3	3	5-7	6
5	Rock Creek near mouth (RM 606.8/0.2)	170 (est)	8.1-8.3	650-900	8.0-11.0	8.5-10.6	84-100	243	14-43	29	7-11	11
6	Rock Creek downstream from Canyon Trout Farm (RM 606.8/4.3)	165	7.7-8.0	750-900	8.0-12.0	6.4-8.2	66-80	251	19-42	30	8-18	11
7	Rock Creek upstream of US-30 Highway Bridge (RM 606.8/6.6)		7.2-8.0	750-875	9.0-11.0	5.2-7.0	54-71	232	14-46	32	6-16	12
8	Rock Creek upstream of Frame Trout Farm (RM 606.8/8.5)		7.2-7.9	700-750	8.5-12.0	5.8-7.0	62-69	217	22-140	57	7-24	12
9	Rock Creek upstream of Twin Falls Fish Hatchery (RM 606.8/9.4)		7.7-7.9	700-750	9.0-12.0	5.6-6.7	60-68	215	26-130	62	9-24	12
10	Rock Creek at Eastland Road Bridge (RM 606.8/11.8)		7.8-8.3	650-800	9.0-12.5	6.8-8.8	69-94	213	40-100	65	10-115	38
11	Rock Creek at North 3400 Road Bridge (RM 606.8/14.7)	33	7.9-8.3	650-725	5.0-9.0	8.4-11.6	84-112	212	1-3	2	3-4	4

a/ See Figure 2.

TABLE 5

RESULTS OF BACTERIOLOGICAL ANALYSIS
SNAKE RIVER, ROCK CREEK, AND PERRINE COULEE
NOVEMBER 12-16, 1971

Map Key[a/]	Station Description	Total Coliform Count/100 ml			Fecal Coliform Count/100 ml			Fecal Streptococcus Count/100 ml		
		Maximum	Arith. Mean	Minimum	Maximum	Arith. Mean	Minimum	Maximum	Arith. Mean	Minimum
1	Snake River downstream from Rock Creek (RM 606.2)	1,500,000	480,000	42,000	500	340	<10	28,000	13,600	850
2	Snake River upstream of Rock Creek and downstream from Twin Falls wastewater treatment plant (RM 610.0)	48,000	24,900	7,300	100	60	30	900	410	200
3	Snake River upstream of Perrine Coulee (RM 611.5)	74,000	38,000	9,000	120	60	<10	350	230	100
4	Perrine Coulee near mouth (RM 611.3/0.2)	610	280	160	170	45	<10	300	145	30
5	Rock Creek near mouth (RM 606.8/0.2)	100,000,000	22,100,000	80,000	7,000	<2,400	<1,000	820,000	282,000	180
6	Rock Creek downstream from Canyon Trout Farm (RM 606.8/4.3)	19,000,000	438,000	180,000	4,100	1,400	170	380,000	204,000	100,000
7	Rock Creek upstream of US-30 Highway Bridge (RM 606.8/6.6)	>800,000	>440,000	100,000	21,000	9,000	<1,000	560,000	297,000	16,000
8	Rock Creek upstream of Frame Trout Farm (RM 606.8/8.5)	460,000	157,000	48,000	36,000	14,300	500	370,000	>129,000	20,000
9	Rock Creek upstream of Twin Falls Fish Hatchery (RM 606.8/9.4)	150,000	65,800	15,000	27,000	8,800	<100	<230,000	<59,000	1,900
10	Rock Creek at Eastland Road Bridge (RM 606.8/11.8)	450,000	223,600	15,000	33,000	11,900	<100	83,000	45,200	5,000
11	Rock Creek at North 3400 Road Bridge (RM 606.8/14.7)	400	190	40	80	35	<10	470	140	<10

a/ See Figure 2.

TABLE 6

SUMMARY OF HEAVY METAL DATA AT SELECTED STATIONS
SNAKE RIVER, ROCK CREEK AND PERRINE COULEE
NOVEMBER 12-16, 1971

Map Key[a]	Station Description	Cadmium mg/l[b] range	Copper mg/l range	Chromium mg/l[b] range	Lead mg/l[b] range	Zinc mg/l range	Mercury µg/l range
1	Snake River downstream from Rock Creek (RM 606.2)	<0.01	<0.02-0.04	<0.02	<0.03	<0.01-0.03	<0.2-1.1
2	Snake River upstream of Rock Creek and downstream from Twin Falls Wastewater Treatment Plant (RM 610.0)	<0.01	<0.02-0.08	<0.02	<0.03	<0.01-0.02	<0.2-1.0
3	Snake River upstream of Perrine Coulee (RM 611.5)	<0.01	<0.02-0.06	<0.02	<0.03	<0.01-0.01	<0.2-1.1
4	Perrine Coulee near mouth (RM 611.3/0.2)	<0.01	<0.02[b]	<0.02	<0.03	<0.01-0.01	<0.2-0.6
5	Rock Creek near mouth (RM 606.8/0.2)	<0.01	<0.02[b]	<0.02	<0.03	<0.01-0.03	<0.2-1.1
11	Rock Creek at North 3400 Rock Bridge (RM 606.8/14.7)	<0.01	<0.02[b]	<0.02	<0.03	<0.01-0.01	<0.2-0.9

a/ See Figure 2.
b/ All values were the same.

Water quality of Rock Creek (RM 11.2) was further degraded by wastewater from Independent Meat Company. This company discharges an effluent containing an average of 147 pounds of BOD per day and an average total- and fecal-coliform bacteria density of less than 251,000 and 71,000/100 ml, respectively. Rock Creek at RM 9.4 showed a DO concentration range of 5.6 to 6.7 mg/l (60 to 68 percent of saturation) and total- and fecal-coliform bacterial densities of 65,800 and 8,800/100 ml, respectively, both of which are violations of the Idaho State Water Quality Standards.

The quality of Rock Creek from RM 9.4 downstream to RM 8.5 did not change appreciably, with the exception of coliform bacteria densities. The average total- and fecal-coliform bacterial densities increased from 65,800 to 157,000/100 ml and from 8,800 to 14,300/100 ml, respectively. Several cattle holding pens, located on the banks of Rock Creek in this reach, are the probable reason for this increase.

Idaho Frozen Foods was discharging, also at the time of the survey, an effluent (RM 8.2) that contained an average of 16,800 pounds of BOD per day. Total- and fecal-coliform bacterial densities ranged from 1,700,000 to 1,600,000,000/100 ml, and from 17,000 to 1,600,000/100 ml, respectively. Idaho bacterial criteria were violated in this reach [RM 8.2 to 6.6] of Rock Creek.

Colonial Concrete, Inc., discharged highly turbid wastewater to Rock Creek at RM 6.5. This discharge results in the deposit of sediment in the creek, a violation of Water Quality Standards.

From RM 4.3 to the mouth there were no apparent wastewater discharges. The flow in this reach was rapid and turbulent, allowing for reaeration. Near the mouth DO values were similar to those observed at RM 14.7 (i.e.,

ranges of 8.5 to 10.6 mg/1 and 8.4 to 11.6 mg/1, respectively). However, the BOD and the total- and fecal-coliform bacterial densities had increased by fourteen, five and two orders of magnitude, respectively [Tables 4 and 5].

Visual observations made during the survey showed that sludge beds existed in Rock Creek downstream from Amalgamated Sugar Company and Idaho Frozen Foods. *Sphaerotilus* was observed in the creek from just downstream from the Amalgamated Sugar Company discharge to the mouth. Due to the turbulent mixing action of Rock Creek, large amounts of foam occurred near the mouth of Rock Creek.

Water samples collected at selected stations in Rock Creek show that heavy metals do not pose a water quality problem [Table 6].

In summary, the water quality of Rock Creek was found to be severely degraded by industrial discharges between RM 606.8/14.7 and RM 606.8/4.3. Due to water turbulence in Rock Creek the DO concentrations at the mouth were similar to those observed upstream of all industrial discharges (RM 14.7). Between these stations the BOD levels and the total- and fecal-coliform bacterial densities on the other hand, increased by factors of 14; 116,000; and 80 times, respectively.

Industrial discharges from Amalagamated Sugar Company, Independent Meat Company, Idaho Frozen Foods, and Colonial Concrete, Inc., resulted in violations of Section 6A, 6B, and 6D of the Idaho State Standards applicable to all state waters. As noted earlier, discharges from Idaho Frozen Foods and Independent Meat Company are to be connected by July 1, 1973, to the Twin Falls Municipal Wastewater Treatment Plant [Appendix E]. This will reduce the pollutant loads being discharged to Rock Creek.

B. SNAKE RIVER

The flow of the Snake River in the Twin Falls area is controlled by Milner Reservoir (RM 640.0). The flow observed in the Snake River downstream from the reservoir was 8,350 cfs.* The River upstream of Perrine Coulee (RM 611.5) had high DO and low BOD ranges (10.4 to 11.3 mg/l and less than 2 to 3 mg/l, respectively). However, the average total- and fecal-coliform bacterial densities were high (38,000 and 9,000/100 ml, respectively), thus constituting a violation of the Idaho Water Quality Standards.

Perrine Coulee and the Twin Falls Wastewater Treatment Plant discharge to the Snake River at RM 611.3 and RM 610.2, respectively. Perrine Coulee discharged approximately 340 pounds of BOD per day (3 mg/l) and the average total- and fecal-coliform bacterial densities were 280 and 45/100 ml, respectively. Effluent from the municipal plant contained 8,120 pounds of BOD per day (220 mg/l), and the total- and fecal-coliform bacterial densities ranged from 40 to greater than 800,000/100 ml and from less than 10 to greater than 60,000/100 ml, respectively. The effect of these two inflows on the quality of the Snake River could not be measured downstream at RM 610.0.

Rock Creek joins the Snake River at RM 606.8. The 170 cfs from Rock Creek contained 26,500 pounds of BOD per day and total- and fecal-coliform bacteria densities of 22,100,000 and 2,400/100 ml, respectively. The Snake River at RM 606.2 shows the effect of Rock Creek even though the dilution

* Flow is for the Snake River near Kimberly, Idaho, and was provided by the USGS Water Resources Division, Boise, Idaho.

was 49-to-1. Average levels of BOD increased from 2 mg/l (RM 610.0) to 4 mg/l (RM 606.2). Average total- and fecal-coliform bacterial densities increased from 24,900 to 480,000/100 ml and from 60 to 340/100 ml, respectively at these two River stations. This increase in total coliform organisms violates Idaho Water Quality Standards for Interstate Waters.

Water samples collected at selected stations in the Snake River show that heavy metals do not pose a water quality problem [Table 6].

In summary, both Perrine Coulee and the Twin Falls Municipal Wastewater Treatment Plant appear to have little effect on the water quality of the Snake River. Rock Creek, however, adversely affects the water quality of the Snake River, increasing the total-coliform bacterial density by 20 times. This increase violates the bacterial criteria established for the Snake River as stated in the Idaho Water Quality Standards for interstate waters [Appendix A].

APPENDIX A

IDAHO WATER QUALITY STANDARDS
FOR INTERSTATE WATERS
(APPLICABLE TO SNAKE RIVER)

JUNE 1967

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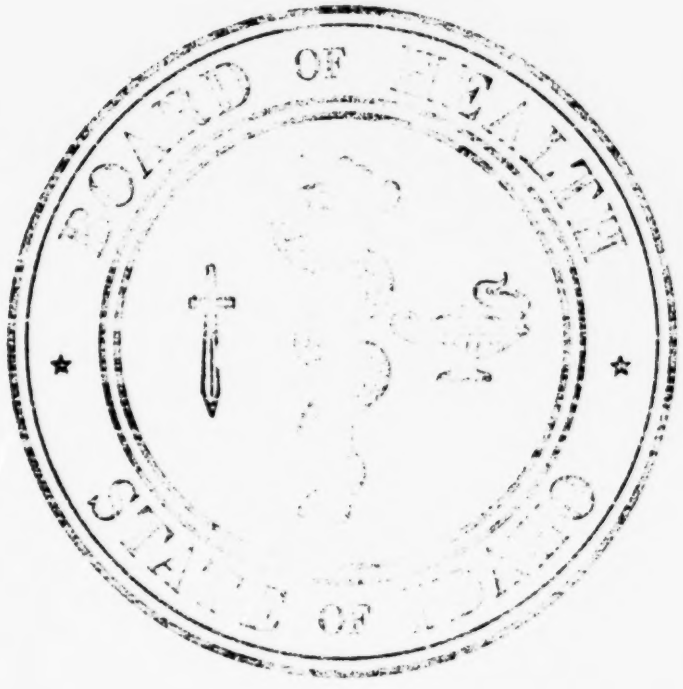
RULES AND REGULATIONS

FOR

STANDARDS OF WATER QUALITY FOR THE

INTERSTATE WATERS OF IDAHO

AND DISPOSAL THEREIN OF SEWAGE AND INDUSTRIAL WASTES



IDAHO STATE BOARD OF HEALTH

June 1967

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The following definitions shall apply to the interpretation and the enforcement of these regulations:

"Sewage" means the water-carried human or animal waste from residences, buildings, industrial establishments or other places together with such ground water infiltration and surface water as may be present. The admixture with sewage as above defined of industrial wastes or wastes, as defined in the following paragraphs 2 and 3, shall also be considered "sewage."

"Industrial waste" means any liquid, gaseous, radioactive or solid waste substance or a combination thereof resulting from any process of industry, manufacturing, trade or business, or from the development or recovery of any natural resources.

"Wastes" means sewage, industrial wastes, and all other liquid, gaseous, solid, radioactive or other substances which will or may cause pollution or tend to cause pollution of the public waters of the state.

"Pollution" means such contamination or other alteration of the physical, chemical or biological properties of the public waters of the state, including change in temperature, taste, color, turbidity or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive or other substance into the waters of the state which either by itself or in connection with any other substance present, will or can reasonably be expected to create a public nuisance or render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational or other legitimate uses or to livestock, wildlife, fish or other aquatic life or the habitat thereof.

"Standard" or "standards" means such measure of quality or purity in relation to their reasonable and necessary use as may be established by the State Board of Health.

"River mile" means the distance in miles a specified location is from the mouth of the stream.

1. POLICIES OF THE STATE BOARD OF HEALTH

A. INTERSTATE COMPACTS, COURT DECREES AND ADJUDICATED WATER RIGHTS

It shall be the policy of the State Board of Health that the adoption of water quality standards for interstate streams and the enforcement of such standards is not intended to conflict with the apportionment of water to the State of Idaho through any of the interstate compacts or court decrees or to interfere with the rights of Idaho appropriators in the utilization of the water appropriations which have been granted to them under the statutory procedure or water quality criteria established by mutual agreement of the participants in interstate water pollution control enforcement procedures.

B. HIGHEST AND BEST PRACTICABLE TREATMENT AND CONTROL REQUIRED

It shall be the policy of the State Board of Health that, notwithstanding the water quality standards contained herein, where a higher standard can be achieved, the highest and best practicable treatment and/or control of wastes, activities and flows shall be provided so as to maintain dissolved oxygen at the highest desirable levels and overall water quality as good as possible, and water temperatures, coliform bacteria concentrations, dissolved chemical substances, toxic materials, radioactivity, turbidities, color, odor and other deleterious factors at the lowest desirable levels. Such policy to apply not only to existing waste sources but to future waste sources as they may develop and for such other interstate streams not listed herein.

2. RESTRICTIONS ON THE DISCHARGE OF SEWAGE AND INDUSTRIAL WASTES AND HUMAN ACTIVITIES WHICH AFFECT WATER QUALITY IN THE WATERS OF THE STATE

No wastes shall be discharged and no activities shall be conducted in such a way that said wastes or activities either alone or in combination with other wastes or activities will violate or can reasonably be expected to

violate the water quality standards contained herein.

3. MAINTENANCE OF STANDARDS OF QUALITY

A. The degree of sewage or waste treatment required to restore and maintain the standards of quality shall be determined in each instance by the State Board of Health and shall be based upon the following:

(1) The uses which are or may likely be made of the receiving stream.

(2) The size and nature of flow of the receiving stream.

(3) The quantity and quality of the sewage or wastes to be treated.

(4) The presence or absence of other sources of pollution on the same watershed.

B. The water quality standards are subject to revision (following public hearings and concurrence of the U. S. Secretary of Interior in the case of interstate streams) as technical data, surveillance programs, and technological advances make such revisions desirable.

C. For purposes of enforcement of these standards, sampling will be done at a point where these standards can be evaluated, except for areas immediately adjacent to outfalls. Cognizance will be given to the opportunity for admixture of waste effluents with receiving waters.

D. Tests or analytical procedures to determine compliance with standards will, insofar as practicable and applicable, be made in accordance with the methods given in the twelfth edition of "Standard Methods for the Examination of Water and Waste Water" published by the American Public Health Association, or in accordance with tests or analytical procedures that have been found to be equal or more applicable and satisfactory and accepted and approved by the State Board of Health, as set forth in Appendix 1.

4. GENERAL WATER QUALITY STANDARDS FOR INTERSTATE STREAMS

The following General Water Quality Standards shall apply to all interstate

waters of the state in addition to the water quality standards set forth herein for the various specified and unspecified interstate waters of the state. Interstate waters shall not contain:

A. Toxic or Other Deleterious Substances (pesticides, phenolics and related organic and inorganic materials)

(1) Toxic chemicals of other than natural origin in concentrations found to be of public health significance or adversely affect the use indicated.* (See Appendix 2)

(2) Deleterious substances of other than natural origin in concentrations that cause tainting of edible species or tastes and odors to be imparted to drinking water supplies.

B. Radioactive Materials

(1) Radioactive materials of other than natural origin shall not be present in any amount which reflects failure in any case to apply all controls which are physically and economically feasible. In no case shall such materials exceed the limits established in the 1962 U. S. Public Health Service Drinking Water Standards.

C. Aesthetic Considerations (water offensive to the senses of sight, taste smell or touch)

(1) Floating or submerged matter not attributable to natural causes.

(2) Excess nutrients of other than natural origin that cause visible slime growths or other nuisance aquatic growths.

(3) Visible concentrations of oil, sludge deposits, scum, foam or other wastes that may adversely affect the use indicated.

(4) Objectionable turbidity which can be traced to a point source.

*Guides such as the Water Quality Criteria published by the State of California Water Quality Control Board (Second Edition, 1963) will be used in evaluating the tolerances of the various toxic chemicals for the use indicated.

WATER QUALITY STANDARDS FOR PUBLIC WATERS OF THE MAIN STEM OF THE SNAKE RIVER FROM THE WYOMING-IDAHO BORDER (RIVER MILE 918) TO THE OREGON-IDAHO BORDER (RIVER MILE 407); NORTH FORK TETON RIVER; HENRY'S FORK FROM JUNCTION WITH FALLS RIVER TO THE SNAKE RIVER; RAFT RIVER; GOOSE CREEK; SALMON FALLS CREEK; JARBRIDGE RIVER AND THE BRUNEAU RIVER.

1. No wastes shall be discharged and no activities shall be conducted which either alone or in combination with other wastes or activities will cause in these waters:

   A. Organisms of the Coliform Group where Associated with Fecal Sources (MPN, equivalent MF or appropriate test using a representative number of samples)

      Average concentrations of coliform bacteria to exceed 1,000 per 100 milliliters, with 20 per cent of samples not to exceed 2,400 per 100 milliliters.

   B. Dissolved Oxygen (DO)

      DO to be less than 75 per cent of saturation at seasonal low or less than 100 per cent saturation in spawning areas during spawning, hatching and fry stages of salmonid fishes.

      Exception: Five parts per million at Milner Dam based on a minimum stream flow of 600 cubic feet per second at this point.

   C. Hydrogen Ion Concentration (pH)

      pH values to be outside the range of 7.0 to 9.0. Induced variation not to be more than 0.5 pH unit.

   D. Temperature

      Any measurable increase when stream temperatures are 68°F. or above, or more than 2°F. increase when stream temperatures are 66°F. or less.

Appendix 1

LABORATORY TESTS AND PROCEDURES

Standard Methods for the Examination of Water and Wastewater, Twelfth Edition, 1965, prepared and published jointly by American Public Health Association, American Water Works Association, Water Pollution Control Federation.

BENEFICIAL USES TO BE PROTECTED

Appendix 2

	Domestic Water Supply	Industrial Water Supply	Irrigation	Livestock Watering	Salmonid Fish Spawning	Salmonid Fish Rearing	Other Fishing & Acquatic Life	Hunting & Wildlife	Water Skiing and Swimming	Pleasure Boating	Aesthetic Qualities
Bear River, Cub River, Worm Creek, and Malad River	X(1)	X	X	X	X(5)	X	X	X	X(2)	X(2)	X
Bear Lake	X	X	X	X	X	X	X	X	X	X	X
Henry's Fork and North Fork Teton River	X	X	X	X	X	X	X	X	X(2)	X(2)	X
Snake River:											
Wyoming Border to American Falls Reservoir	X	X	X	X	X	X	X	X	X(2)	X(2)	X
American Falls Reservoir to Hagerman	X	X	X	X		X	X	X	X(2)	X(2)	X
Hagerman to Hells Canyon Dam	X	X	X	X		X	X	X	X(2)	X(2)	X
Hells Canyon Dam to Lewiston	X	X	X	X	X(3)	X	X	X	X	X	X
Raft River, Goose Creek, Salmon Falls Creek, Jarbridge River, Bruneau River	X	X	X	X	X	X	X	X	X(2)	X(2)	X
Palouse River	X	X	X	X	X(5)	X	X	X	X		X
Pend Oreille River, Pend Oreille Lake, Priest Lake, Coeur d'Alene Lake	X	X	X		X	X	X	X	X	X	X
Kootenai River, Clark Fork River, Moyie River, Priest River	X	X	X	X	X	X	X	X	X	X	X
Spokane River, Coeur d'Alene River above Enaville (4)	X	X	X	X	X(5)	X	X	X	X		X

(1) Domestic water supply for Bear River

(2) Water skiing and pleasure boating on reservoir portions of stream

(3) Anadromous fish passage use as well

(4) Determination of uses of Coeur d'Alene River below Enaville will be done when construction of domestic and mine waste treatment facilities has been completed, or not later than July 1, 1969

(5) Upper reaches of stream

APPENDIX B

IDAHO WATER QUALITY STANDARDS

FOR ALL STATE WATERS

SEPTEMBER 1968

B-ii

RULES AND REGULATIONS

FOR

THE ESTABLISHMENT OF STANDARDS OF WATER QUALITY

AND FOR WASTE WATER TREATMENT REQUIREMENTS FOR WATERS OF THE STATE OF IDAHO

IDAHO STATE BOARD OF HEALTH

September 1968

RULES AND REGULATIONS
FOR THE ESTABLISHMENT OF STANDARDS OF WATER QUALITY AND FOR WASTE WATER TREATMENT REQUIREMENTS FOR WATERS OF THE STATE OF IDAHO

LEGAL AUTHORITY

The Idaho State Board of Health, pursuant to the authority granted in Title 39, Chapter 1, Idaho Code, Sections 39-105 and 39-112, did adopt the following Rules and Regulations for the Establishment of Standards of Water Quality and for Waste Water Treatment Requirements for Waters of the State of Idaho while in regular quarterly session on August 15, 1968, at Coeur d'Alene, Idaho, and did determine the effective date to be September 4, 1968.

PREAMBLE

It shall be the policy of the State Board of Health to provide for an orderly and economically feasible comprehensive water pollution control program, which program shall be administered to conserve the waters of the State for all legitimate beneficial uses, including uses for domestic purposes, agriculture, industry, recreation, and fish and wildlife propagation.

The Board recognizes that the control of water pollution involves many factors, including multiple water uses, economic considerations and overall benefits to the citizens of the State. It shall be the policy of the Board to carry out such a program on a cooperative voluntary and educational basis insofar as such a policy is compatible with statutory duties of the Board.

The Department of Health shall, on the basis of necessary technical studies, determine waste treatment needs throughout the State and shall establish recommended time tables for the provision of such treatment facilities as will be necessary to abate pollution of the waters of the State.

These regulations are intended to be in harmony with existing interstate stream regulations and as an administrative guide for the continuation and supplementation of the program previously carried out by the Board. The regulations are general in nature and are intended for use until such time as the staff of the Department of Health may be able to gather sufficient data to determine more precise quality standards for such individual streams as uses may indicate and until such time as the staff of the Department develops the capability of initiating a permit system as provided in the Idaho statutes.

For these reasons, paragraph 3A should be considered as the basic working arrangement of the water pollution control program which provides, in effect, special consideration for each and every waste source on the basis of special problems peculiar to that source.

DEFINITIONS

The following definitions shall apply to the interpretation and the enforcement of these regulations:

"Sewage" means the water-carried human or animal waste from residences, buildings, industrial establishments or other places together with such ground

water infiltration and surface water as may be present. The admixture with sewage as above defined of industrial wastes or wastes, as defined in the following paragraphs 2 and 3, shall also be considered "sewage."

"Industrial waste" means any liquid, gaseous, radioactive or solid waste substance or a combination thereof resulting from any process of industry, manufacturing, trade or business, or from the development or recovery of any natural resources.

"Wastes" means sewage, industrial wastes, and all other liquid, gaseous, solid, radioactive or other substances which will or may cause pollution or tend to cause pollution of the public waters of the State.

"Pollution" means such contamination or other alteration of the physical, chemical or biological properties of the public waters of the State, including change in temperature, taste, color, turbidity or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive or other substance into the waters of the State which either by itself or in connection with any other substance present, will or can reasonably be expected to create a public nuisance or render such waters harmful, detrimental or injurious to public health, safety, or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate uses or to livestock, wildlife, fish or other aquatic life or the habitat thereof.

"Standard" or "standards" means such measure of quality or purity in relation to their reasonable and necessary use as may be established by the State Board of Health.

1. WATER RIGHTS

It shall be the policy of the State Board of Health that the adoption of water quality standards and regulations and the enforcement of such standards and regulations is not intended to conflict with the apportionment of water to the State of Idaho, to any of the interstate compacts or court decrees, or to interfere with the rights of Idaho appropriators in the utilization of water rights.

2. HIGHEST AND BEST PRACTICABLE TREATMENT AND CONTROL REQUIRED

Notwithstanding the water quality standards contained herein, where a higher standard can be achieved, the highest and best practicable treatment and/or control of wastes, activities and flows shall be provided so as to maintain dissolved oxygen at the highest desirable levels and overall water quality as good as practicable, and water temperatures, coliform bacteria concentrations, dissolved chemical substances, toxic materials, radioactivity, turbidities, color, odor and other deleterious factors at the lowest desirable levels.

3. RESTRICTIONS ON THE DISCHARGE OF SEWAGE AND INDUSTRIAL WASTES AND HUMAN ACTIVITIES WHICH AFFECT WATER QUALITY IN THE WATERS OF THE STATE

A. No wastes shall be discharged and no activities shall be conducted in such a way that said wastes or activities either alone or in combination

with other wastes or activities will violate or can reasonably be expected to violate the water quality standards and/or regulations contained herein.

B. It is noted that from time to time certain short-term activities which are deemed necessary to accommodate essential activities and protect the public interest may be specially authorized by the Department of Health under such conditions as the Department of Health may prescribe even though such activities may result in a reduction of water quality conditions below those criteria and classifications established by this regulation.

4. MAINTENANCE OF STANDARDS OF QUALITY

A. The degree of sewage or waste treatment required to restore and/or maintain the standards of quality and/or maintain existing quality shall be determined in each instance by the State Board of Health and shall be based upon the following:

(1) The uses which are or may likely be made of the receiving stream.

(2) The size and nature of flow of the receiving stream.

(3) The quantity and quality of the sewage or wastes to be treated.

(4) The presence or absence of other sources of pollution on the same watershed.

B. For purposes of enforcement of these standards and regulations, sampling will be done at a point where these standards and/or regulations can be evaluated, except for areas immediately adjacent to outfalls. Cognizance will be given to the opportunity for admixture of waste effluents with receiving waters, where such admixing is planned and carried out in a manner that will provide minimum degradation to receiving waters.

5. GENERAL WATER QUALITY STANDARDS FOR WATERS OF THE STATE

The following general water quality standards will apply to waters of the State, both surface and underground, in addition to the water quality standards set forth on specifically identified waters. Waters of the State shall not contain:

A. Toxic chemicals of other than natural origin in concentrations found to be of public health significance or to adversely affect the use indicated. (Guides such as the Water Quality Criteria, published by the State of California Water Quality Control Board (Second Edition, 1963) will be used in evaluating the tolerances of the various toxic chemicals for the use indicated.)

B. Deleterious substances of other than natural origin in concentrations that cause tainting of edible species or tastes and odors to be imparted to drinking water supplies.

C. Radioactive materials or radioactivity in water which exceed (1) 1/30th of the MPC values given in Column 2, Table I, Appendix A, Part C, Rules and Regulations for the Control of Radiation in the State of Idaho, (2) exceeds concentration limits of the Idaho Drinking Water Standards for waters used for, or likely to be used for, domestic supplies, (3) results in accumulations of radioactivity in edible plants and animals that present a hazard to consumers, and/or (4) is harmful to aquatic life.

D. Floating or submerged matter not attributable to natural causes.

E. Excess nutrients of other than natural origin that cause visible slime growths or other nuisance aquatic growths.

F. Visible concentrations of oil, sludge deposits, scum, foam or other wastes that may adversely affect the use indicated.

G. Objectionable turbidity which can be traced to a point source or sources.

ON THE BASIS OF THE PRECEDING GENERAL WATER QUALITY STANDARDS, THE FOLLOWING NUMERICAL STANDARDS, WHERE APPLICABLE, SHALL BE APPLIED, EXCEPT WHERE DIFFERENCES OCCUR BETWEEN NUMERICAL STANDARDS CONTAINED HEREIN AND THOSE PREVIOUSLY ADOPTED FOR SPECIFICALLY IDENTIFIED INTERSTATE STREAMS. IN SUCH CASES, STANDARDS FOR INTERSTATE STREAMS SHALL APPLY.

6. NO WASTES SHALL BE DISCHARGED AND NO ACTIVITIES SHALL BE CONDUCTED WHICH EITHER ALONE OR IN COMBINATION WITH OTHER WASTES OR ACTIVITIES WILL CAUSE IN THESE WATERS:

A. Organisms of the Coliform Group where Associated with Fecal Sources

(MPN, equivalent MF or appropriate test using a representative number of samples.) Average concentrations of coliform bacteria to exceed 1,000 per 100 milliliters, with 20 percent of samples not to exceed 2,400 per 100 milliliters.

B. Dissolved Oxygen (DO)

DO to be less than 75 percent of saturation at seasonal low or less than 100 percent saturation in spawning areas during spawning, hatching, and fry stages of salmonid fishes.

C. Hydrogen Ion Concentration (pH)

pH values to be outside the range of 6.5 and 9.0. Induced variation not to be more than 0.5 pH unit.

D. Temperature

Any measurable increases when stream temperatures are 68° F. or above, or more than 2° F. increase when stream temperatures are 66° F. or less.

E. Turbidity

Turbidity, other than of natural origin, to exceed 10 Jackson Turbidity Units (JTU). (This turbidity requirement shall not be deemed to rigidly apply to streams, drain ditches, etc., receiving irrigation return flow. However, every reasonable effort should be made to prevent excessive turbidity from such wastes.)

IN ADDITION TO THE GENERAL STANDARDS CONTAINED HEREIN, THE FOLLOWING NUMERICAL STANDARDS SHALL APPLY TO THOSE WATERS OF THE STATE WHICH ARE PRESENTLY UPSTREAM FROM EXISTING SIGNIFICANT WASTE SOURCES AND TO ALL LAKES AND RESERVOIRS USED PRIMARILY FOR RECREATION, DRINKING WATER SUPPLIES, FISH AND WILDLIFE PROPOGATION AND/OR AESTHETIC PURPOSES.

7. NO WASTES SHALL BE DISCHARGED AND NO ACTIVITY SHALL BE CONDUCTED WHICH ALONE OR IN COMBINATION WITH OTHER WASTES WILL CAUSE IN THESE WATERS:

A. Organisms of the Coliform Group

Average concentration of coliform bacteria to exceed 240 per 100 milliliters with 20 percent of the samples not to exceed 1,000 per 100 milliliters and fecal coliform not to exceed 50 per 100 milliliters with 20 percent of the samples not to exceed 200 per 100 milliliters.

B. Dissolved Oxygen (DO)

DO to be less than 75 percent of saturation at seasonal low or less than 100 percent saturation in spawning areas during spawning, hatching, and fry stages of salmonid fishes.

C. Hydrogen Ion Concentration (pH)

pH values to be outside the range of 6.5 to 9.0. Induced variation not to be more than 0.5 pH unit.

D. Temperature

Any measurable increase when stream temperatures are 56° F. or above, or more than 2° F. increase when stream temperatures are 64° F. or less.

E. Turbidity

Turbidity, other than of natural origin, to exceed 5 Jackson Turbidity Units (JTU).

F. Phosphorus or Nitrogen Compounds

Measurable concentration of phosphorus or nitrogen compounds above those of natural origin.

8. REGULATIONS GOVERNING WASTE DISCHARGES

A. Any person or persons, corporation, officers of any municipality, sewer district or association which owns or operates any facility or carries

out any operation which results in the discharge of waste water shall furnish to the Department of Health such information concerning quality and quantity of discharged waste waters and maintain such treatment records as the Department may reasonably require to evaluate the effects on any receiving waters.

B. For the purposes of these regulations, minimum adequate treatment for domestic sewage or industrial wastes containing significant organic material shall be equal to that which is commonly known as secondary treatment or the equivalent of 85 percent removal of the biochemical oxygen demand including adequate disinfection of any wastes which may contain organisms that may produce disease in man or animals. In industrial processes, in-plant process controls or alterations, carried out for the primary purpose of waste reduction, shall be considered as a part of the treatment process. Exceptions to secondary treatment requirements may be made by the Department of Health when it can be demonstrated that such exceptions will not adversely affect classified water quality and will offer adequate protection for all beneficial uses. Failure to provide adequate treatment shall be considered a violation of these regulations.

C. Any person, persons, corporation or officials of a municipality or sewer district who owns or operates any sewage or other water-borne waste treatment facility shall at all times operate such facility under reasonably competent supervision and with the highest efficiency that can reasonably be expected and shall maintain such facility in good repair.

D. In cases of subsurface sewage or waste disposal, such disposal facilities shall be so located that such sources of pollution including bacteriological, organic or inorganic nutrient pollution will not or will not be likely to enter adjacent waters. In no case shall any portion of such disposal system be located closer than 50 feet horizontally from the edge of any water course, including lakes or reservoirs, as determined from the known highest water level of such water course, lake or reservoir. Improperly or inadequately treated sewage shall not be allowed to accumulate on the ground surface in such a manner that it may create a health hazard.

E. It shall be a violation of these regulations to store, dispose of, or allow to accumulate any deleterious material adjacent to or in the immediate vicinity of any portions of the waters of the State in such a manner that such material will or is likely to enter the stream at times of high water or runoff or where drainage from such materials or accidental failure of storage facilities may transport or allow deleterious material into the water course. Such materials shall include, but not be limited to, trash, rubbish, garbage, oil, gasoline, chemicals, sawdust and accumulations of manure.

F. In case of accidental spills of deleterious materials, persons in responsible charge shall make every reasonable effort to contain spilled material in such a manner that it will not contaminate or pollute any waters of the State, and shall immediately notify the Department of Health of any such spills.

G. Sewage sludge or solid material which may contain disease-producing organisms, when applied to lawns, root crop fields or fields producing foods which may be consumed raw, or otherwise used in such a manner that exposure to persons may be a health hazard, shall be heated to 135° F. or higher for a period of one hour or any equivalent combination of time and temperature approved by the Department of Health before such use.

H. Waste discharges to underground waters shall receive, prior to discharge of such wastes, such treatment as is necessary to render them equal in quality to existing underground waters or such treatment as is necessary to bring such discharge into conformance with the Idaho Drinking Water Standards. The provisions of Paragraph 8H will not be considered as strictly applicable to the existing sink wells used exclusively for irrigation waste water disposal where such disposal does not adversely affect domestic water sources. However, it should be recognized that the long-term preservation of Idaho's vast underground water resources is of great importance and that every reasonable effort should be made to reduce pollution from this source and that a long-term research and development program should be established that will lead to the total elimination of disposal wells that directly affect underground aquifers that are not subject to adequate filtration and percolation to eliminate significant pollution.

Further, this paragraph shall not be construed to preclude the use of deep disposal wells which may be constructed to discharge into underground water strata whose quality is such that it is not likely to be used for other beneficial purposes, provided necessary precautions are taken to prevent contamination of usable aquifers.

I. Sewage Treatment Design Standards and Subsurface Sewage Disposal Standards, as adopted by the Idaho Department of Health, shall be revised from time to time and shall be used as a guide in the review of plans and specifications for waste treatment facilities as required by Section 39-112, Idaho Code.

Regulations relating to Water Pollution Control adopted by the Idaho State Board of Health May 11, 1959, are hereby rescinded.

These Regulations shall be in full force and effect on and after September 4, 1968.

Section 39-112, Par. E --All plans and specifications for the construction of new sewage systems, sewage treatment or disposal plants or systems, or other waste treatment, or disposal facilities, or for improvement or extensions to existing sewerage systems or sewage treatment or disposal plants, shall be submitted to and be approved by the board, before construction thereof may begin.

STUDY METHODS

WASTE SOURCE EVALUATIONS

One municipal and six industrial waste sources were investigated. Information was obtained on water pollution control practices at each plant through in-plant surveys, review of Refuse Act Permit applications and plant officials.

Influent samples of the Twin Falls Wastewater Treatment Plant were collected upstream of the point of supernatant return. Effluent samples were collected upstream of chlorination. All samples were collected with automatic samplers (SERCO) and flow composited according to instantaneous flow readings obtained near the point of collection.

Effluent samples from Amalgamated Sugar Company, Independent Meat Company and Idaho Frozen Foods were collected with automatic samplers and time composited. Water samples were collected manually from effluents of Ready to Pour Concrete; Colonial Concrete, Incorporated; and Frame Trout Farm.

Samples for chemical analyses were collected in clean, unused containers; those for bacteriological analyses were collected in sterile glass containers. The dissolved oxygen samples were collected in 300 ml bottles using a Sargent sampler.

Field measurements of pH, temperature, conductivity and chlorine residual (Twin Falls Wastewater Treatment Plant effluent only) were made periodically. Samples were delivered to the NFIC-D temporary laboratory

(Twin Falls, Idaho) and analyzed for selected parameters (e.g., BOD alkalinity, DO, and settleable solids). Appropriate aliquots were preserved and shipped to the NFIC Laboratory, Denver, Colorado, and analyzed for TOC, COD, heavy metals, oil and grease, and suspended solids.

Grab samples of the municipal and industrial effluents were analyzed for total coliform, fecal coliform and fecal streptococcus by Region X (EPA) Mobile Laboratory in Twin Falls, Idaho.

Bacteriological analyses for total and fecal coliform and for streptococcus were performed according to the accepted, standard method,* using the membrane filter technique.

The BOD and DO tests were determined, according to the accepted standard procedure,* using the azide modification of the Winkler Method.

All other laboratory analyses and field measurements used were conducted in accordance with accepted standard techniques.**

STREAM SURVEYS

The stream surveys were conducted from November 12 to 16, 1971. Eleven stations [Table 4] were sampled. Sampling for chemical and bacteriological analyses was carried out for five days. The time of sampling at each station was varied to obtain the maximum time spread.

Sampling and analytical procedures were the same as described in the previous section. Stream flow measurements were made at selected stations.

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* *Standard Methods for the Examination of Water and Wastewater*, 13th Edition, Americal Public Health Association, New York, NY, 1971.

** *Methods for Chemical Analyses of Water and Wastes*, Environmental Protection Agency, National Environmental Research Center, Analytical Quality Control Laboratory, Cincinnati, Ohio, 1971.

APPENDIX D

EFFLUENT GUIDELINES
FOR
INDUSTRIAL WASTEWATER DISCHARGES

EFFLUENT GUIDELINES FOR INDUSTRIAL WASTEWATER DISCHARGES

The proposed guidelines for those industries evaluated are summarized below.

Amalgamated Sugar Company, Box 127, Twin Falls, Idaho 83301

1. The BOD_5 discharges shall not exceed 0.5 lb/ton of beets sliced.

2. Suspended solids discharge shall not exceed 0.5 lb/ton of beets sliced.

3. The pH shall be between 6.0 and 8.5.

4. No toxic or hazardous material, as designated under the provisions of Section 307 of the Federal Water Pollution Control Act as amended, or known to be hazardous to toxic by the permittee, shall be discharged except with the approval of the Administrator (EPA) or his designee.

5. The number of total coliform bacteria not exceed 1,000 per 100 ml in the effluent.

6. No discharge which may cause toxic or hazardous conditions or accelerate eutrophication in the receiving water, shall be discharged except with the approval of the Administrator (EPA) or his designee.

Colonial Concrete, Incorporated, P.O. Box 1151, Twin Falls, Idaho 83301

1. The effluent discharged to Rock Creek shall not contain more than 20 mg/l each of suspended solids, and COD.

2. Maximum recycling of water is recommended.

Idaho Frozen Foods, Incorporated, P.O. Box FF, Twin Falls, Idaho 83301

1. The BOD discharged shall not exceed 1.0 lb/ton of potatoes processed.

2. The total suspended solids discharged shall not exceed 1.4 lb/ton of potatoes processed.

3. The oil and grease discharged shall not exceed 10 mg/l or 125 lb/day, whichever is less.

4. The pH shall be between 6.0 and 8.5.

5. The number of total coliform bacteria shall not exceed 1,000/100 ml in the effluent.

Independent Meat Company, Box EE, Twin Fall, Idaho 83301

1. The BOD shall not exceed 0.26 lb/1,000 lb of LWK.

2. The total suspended solids discharged shall not exceed 0.35 lb/1,000 lb of LWK.

3. The grease discharged shall not exceed 10 mg/l.

4. The number of total coliform bacteria shall not exceed 1,000/100 ml in the effluent.

5. The ammonia discharge shall not exceed 0.024 lb/1,000 lb of LWK.

6. The pH shall be between 6.0 and 8.5.

Ready to Pour Concrete, P.O. Box 274, Twin Falls, Idaho 83301

1. The effluent discharged to Rock Creek shall not contain more than 20 mg/l each of suspended solids, and COD.

2. Maximum recycling of water is recommended.

Trout Farm and Hatcheries

Provisions shall be made for removal and disposal of solid materials dislodged during the cleaning of raceways, to insure that these materials do not enter the receiving waters.

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APPENDIX E

STATUS REPORT ON

SECONDARY SEWAGE TREATMENT

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STATUS REPORT

on

SECONDARY SEWAGE TREATMENT

* * *

The City of Twin Falls has completed and submitted to the State of Idaho Department of Health a Preliminary Reconnaissance Report on Secondary Sewage Treatment.

Detailed tests have been run to determine the loads and are nearing completion. Our consultant engineer, Cornell, Howland, Hayes & Merryfield, has indicated that the final engineering report will be completed by August 1, 1971.

We have submitted an Application for Funds to the State of Idaho Department of Health. We still intend to meet the time table established by the Idaho Department of Health.

Industries that will be included in the Twin Falls system to date are as follows:

1. Young's Dairy
2. Swift & Company
3. Idaho Frozen Foods
4. Bertie's Poultry
5. Independent Meat
6. Kellwood Company

George F. Michael Jr., P. E.
City Engineer
City of Twin Falls, Idaho

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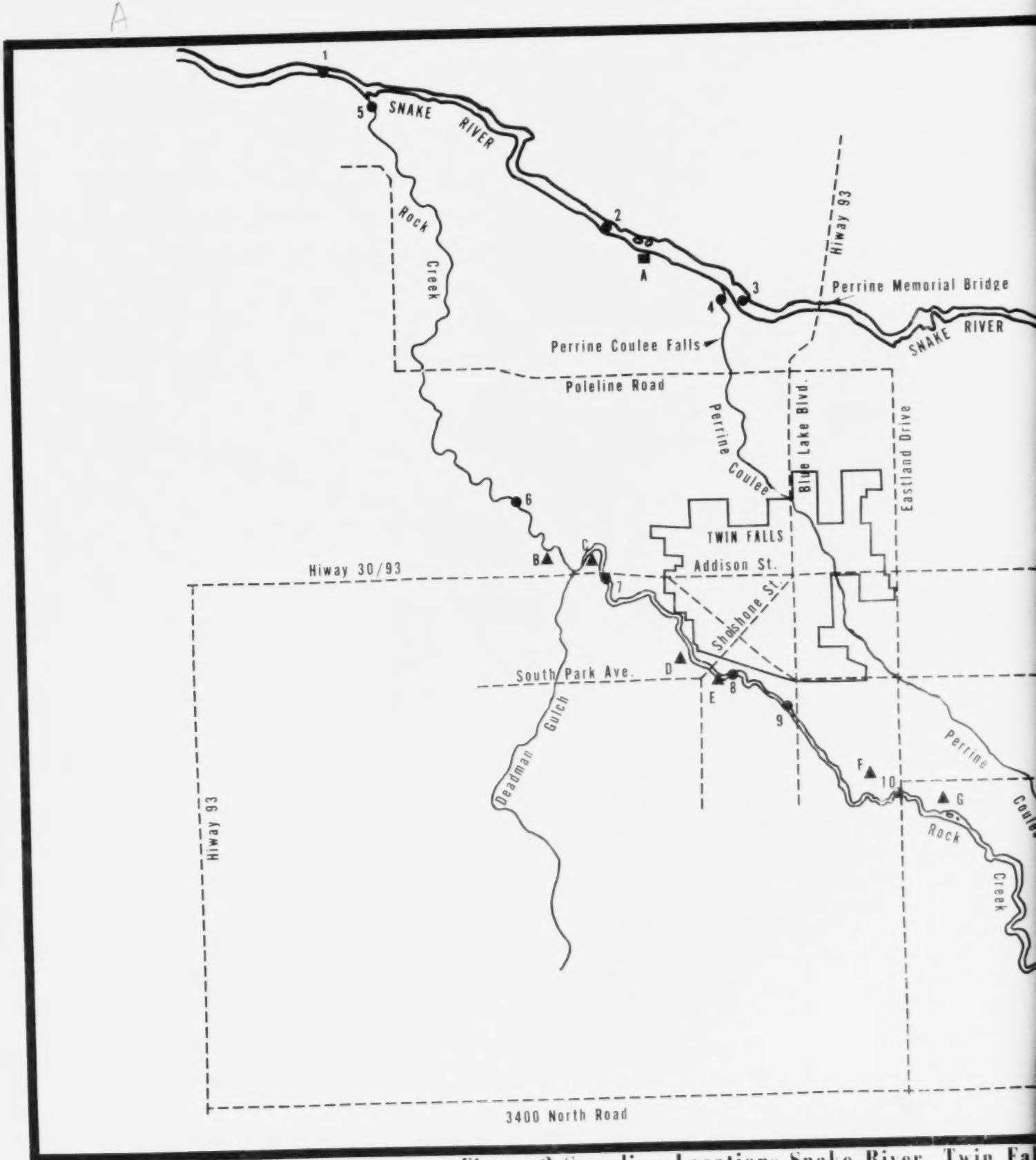

Figure 2 Sampling Locations-Snake River. Twin Fa

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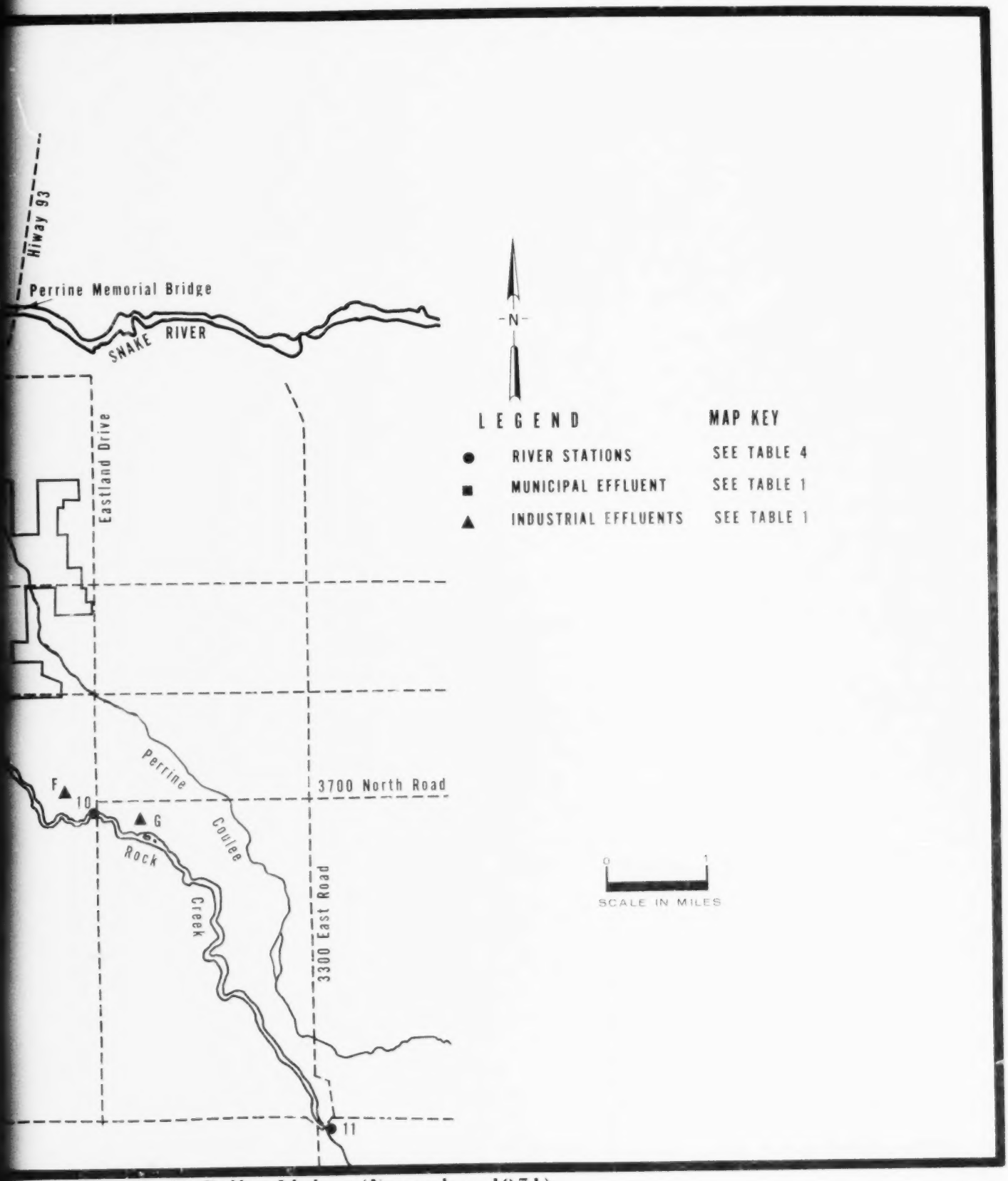

ke River, Twin Falls, Idaho. (November 1971)